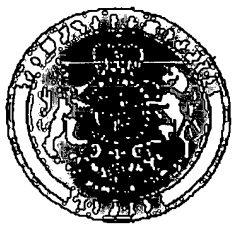
PATENT SPECIFICATION

1141796



NO DRAWINGS

1141796

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COMPLETE SPECIFICATION

Coating Process

We, MIDLAND SILICONES LIMITED, a British Company of Reading Bridge House, Reading, Berkshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of modifying the rate of germination of seeds.

According to the invention there is provided a method for modifying the rate of germination of the seed of a plant which comprises applying to the outer surface of the seed a coating of an organosilicon compound or mixture of organosilicon compounds selected from organohalosilanes, organopolysiloxanes and mixtures of distillable by-produced organosilicon compounds as hereinafter defined.

The invention further includes a seed which has been treated by the said method.

Included within the operative organosilicon compounds are organohalosilanes (e.g. organochlorosilanes) and the organopolysiloxanes which are derivable therefrom. The organo substituents present in the organosilicon compound may be selected from monovalent hydrocarbon radicals for example alkyl radicals such as methyl, ethyl and propyl radicals, alkenyl radicals such as vinyl and allyl radicals and aryl radicals such as phenyl and naphthyl radicals and substituted monovalent hydrocarbon radicals for example aminoalkyl or haloaryl radicals. Most preferred as the organosilicon compounds are the hydrocarbon substituted organochlorosilanes for example dimethyldichlorosilane, methyldichlorosilane, methyltrichlorosilane and phenylmethyldichlorosilane. The organosilicon compound may be employed either alone or in combination with other organosilicon compounds or other materials such as hardening catalysts.

From an economic standpoint particularly suitable organosilicon compounds are the distillable organosilicon compounds which are obtained as a by-product of the direct process reaction for making chlorosilanes. The said direct process reaction is well known and involves the reaction of hydrocarbon halide, usually methyl chloride or chlorobenzene, with silicon at elevated temperatures. It is more fully described for example in Chemistry of the Silicones, by E. G. Rochow at page 149 and Silicones by S. Fordham at page 117. The said by-products are well known as such in the art and comprise a mixture of distillable organosilicon compounds of many different structures and types for example halosilanes, silcarbanes (e.g. dimethylene and dimethylene compounds), polysiloxanes and polysilanes. This mixture may be employed as such or may, if desired, be converted by hydrolysis into a resinous material prior to use. Further, the use of organosilicon by-products of this type appears to lead to an improved rate of germination over that obtained with certain of the more conventional organosilicon materials for example the dimethylpolysiloxane liquids.

Treatment of the seeds according to the method of this invention may be carried out by any suitable means. For example, the organosilicon compound or mixture of organosilicon compounds may be diluted with an organic solvent and the solution then applied to the seeds. After application of the solution the solvent may be allowed to evaporate and, if desired, the rate of evaporation may be increased by gentle heating. Where the use of organic solvent is for some reason undesirable the organosilicon compound or mixture of organosilicon compounds may be dispersed in a more acceptable medium, for example water and the dispersion applied to the seed. The concentration of the organosilicon compound or mixture of organosilicon compounds in the solution or dispersion employed is not critical but may conveniently comprise from

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0.1 to 20 per cent by weight of the total weight of the solution or dispersion.

Another convenient method of treating the seeds comprises exposing them to the vapours of the organosilicon compound or mixture of organosilicon compounds. This latter method is particularly suitable when the organosilicon compound is for example a chlorosilane and is readily volatilised.

The seeds of many varieties of plants exhibit faster germination after treatment according to the method of this invention. This property is particularly surprising as it would have been expected that the seeds when hydrophobed would have been less permeable to moisture and would thus have shown extended germination times. Although some decrease in germination time was shown with normally quickly germinating seeds, the effect appears to be more marked with those seeds which under normal conditions take longer to germinate, for example those of the parsnip.

A further unexpected advantage of the method of this invention is that the treatment of seeds with an organosilicon compound leads, at least in some cases, to an increase in the proportion of seeds which ultimately germinate under a given set of conditions. Such an increase is highly desirable in that it leads to an increased yield of plants for a given quantity of seed.

The following Examples illustrate the invention.

EXAMPLE 1

Four lots A, B, C and D of cress seeds were allowed to germinate at 22°C on moist filter papers in a Petri dish. Prior to being placed on the filter paper the seeds were treated as follows:—

(1) Lot A had been treated by steeping for 1 minute in a 10 per cent by weight solution in petroleum ether of distillable, by-produced organosilicon compounds.

(2) Lot B were steeped for one minute in a dimethylpolysiloxane liquid having a viscosity of 50 cS at 25°C.

(3) Lot C were steeped for one minute in petroleum ether, and

(4) Lot D were employed as a control and were not treated.

The seeds were examined after periods of 22 hours and 48 hours and the numbers which had germinated are shown in Table 1.

TABLE 1

	After 22 hr.	After 48 hr.
Lot A	16	18
Lot B	15	17
Lot C	14	16
Lot D	13	13

EXAMPLE 2

Two lots of one hundred cress seeds were each divided in two further lots of 50 each. Two of these lots of 50 were then treated in the same manner as Lot A in Example 1 and two lots were left untreated. All four lots of seeds were then allowed to germinate on moist filter papers maintained at 22°C in Petri dishes. After 2 days the numbers of seeds which had germinated are shown in Table 2.

TABLE 2

	Treated	Untreated
Lot 1	39	30
Lot 2	43	32